



**peterson energy  
management, inc.**

November 23, 1997

Mr. John Carson  
Mail Code 8ENF-T  
U.S. EPA, Region XII  
999 18<sup>th</sup> Street, Suite 500  
Denver, CO 80202-2466



**RE: EPA Permit No. CO1516-02115**  
Wright's Disposal, Inc.  
Suckla Farms Injection Well #1  
NW/4 Sec. 10-T1N-R67W, Weld County, Colorado

Dear Mr. Carson:

In this report we detail the results of the pressure falloff test conducted in the subject well November 4<sup>th</sup>-November 7<sup>th</sup>, 1997. This is the second pressure falloff test conducted in this well. A previous falloff test was conducted in July, 1993, as part of the EPA Class I permitting process.

Electronic downhole memory pressure gauges were installed at a depth of 9149' on November 4, 1997, with the well taking injection water at a rate of 36 BWPH for eight hours on a vacuum. After recording a stabilized bottom hole injection pressure of 3800 psi, the well was shut in for 69.5 hours with tandem pressure gauges left in the hole at the 9149' packer depth. Recovered data quality was good. Bottom-hole pressure at the conclusion of the test was 3520 psi.

In this report, we have estimated the distance to the injected fluid boundary, which was to be the purpose of the series of pressure falloff tests mandated in the Class I permit. Injected fluids appear to have traveled a distance of 664' from the wellbore. This reflects all fluids injected into the well since inception, not just the volume injected in Class I service. This also represents a swept volume of 32 acres. Calculations employ the Merrill, Kazemi & Gogarty (JPT, 1974) method of estimating injection well flood fronts.

The EPA Final Permit for this facility specified an allowable injection radius of one-quarter mile, or 1320 feet. This analysis indicates that injected fluids have not reached this limit at this time. Given the conservative porosity assumptions

**petroleum engineering**

discussed below, the injected fluid front is at least 656 feet from the specified quarter-mile boundary. To estimate the time remaining before permit limits are reached, we should keep in mind that the distance of the injection front from the wellbore will be increasing at a slower rate as time progresses. We assume a radial configuration for the affected area, and for a constant fluid injection rate, the injection front distance from the wellbore increases only as the square root of injected volumes (or time), not linearly. While successive falloff tests will help locate the injection front, the permit distance limit will not be reached in the near future.

Total system porosity is an important variable affecting test analysis and injection front calculations. As discussed in our 1993 report following the initial falloff test, the openhole log porosity of six percent is likely on the low side, and is not indicative of total system porosity. If system porosity is actually higher, as the well injectivity seems to indicate, the injection front would actually be closer to the wellbore than these calculations indicate. As a result, the distances calculated in this report are believed to be conservative.

The three day shut in period used in this test was adequate for accurate analysis at this time. To see the flood front as distances increase, we suggest that future tests increase the shut in time one day per year, until conditions dictate a slower rate of change. The bottom hole pressure gauges used on this test were necessary, as the well did not maintain a positive surface pressure during the test. This was not the case on the initial falloff test in 1993, when injection rates were higher. Recorded data quality also appeared better on this test than on the 1993 test, which used surface recording gauges.

We have enjoyed this opportunity to be of service to your agency. Please do not hesitate to call with any questions.

Sincerely,

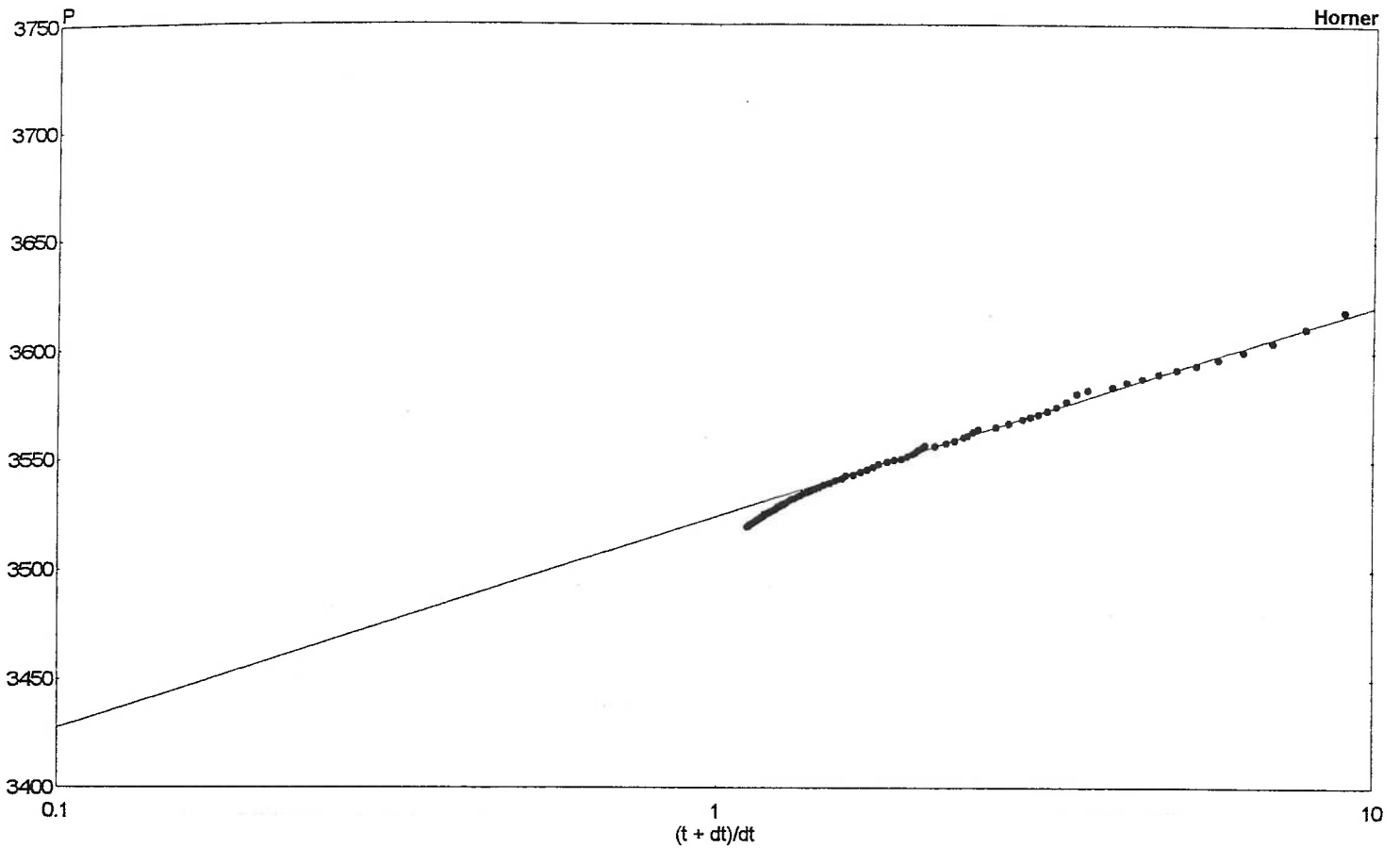
Peterson Energy Management, Inc.



Andy Peterson  
President

cc: Wright's Disposal, Inc.

# Succo #1 Pressure Falloff Test 11/97



## Succo #1 Pressure Falloff Test 11/97

Analysis Results: Horner

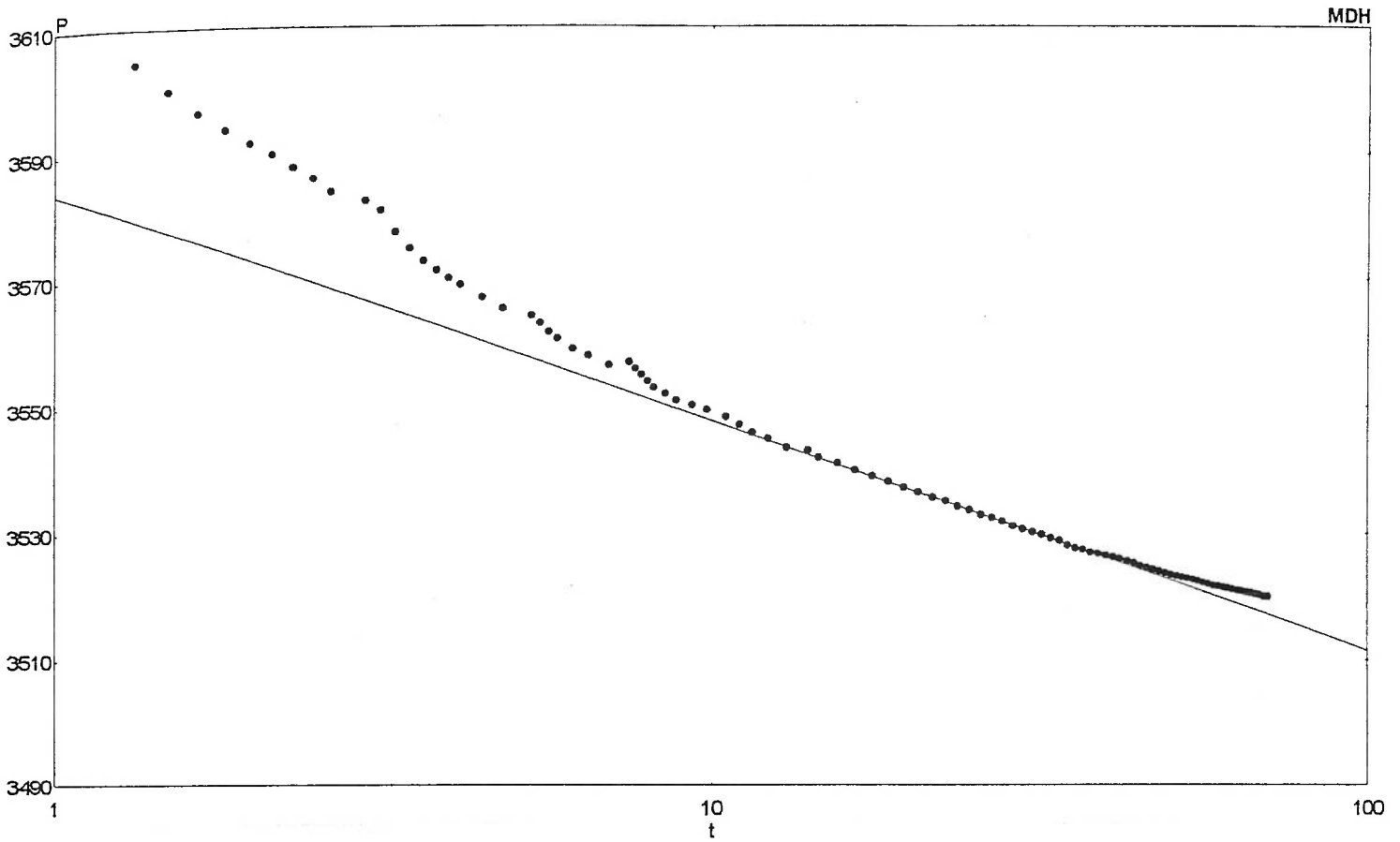
### Parameters:

Slope = 96.7771  
 $m(1 \text{ hr}) = 3616.94$   
 Prd Time: = 8 hr

### Calculated Values:

$kh = 1463.12 \text{ md-ft}$   
 $k = 10.3036 \text{ md}$   
 $Skin = -4.23644$   
 $P^* = 3524.6 \text{ psi}$

# Succo #1 Pressure Falloff Test 11/97



Succo #1 Pressure Falloff Test 11/97

Analysis Results: MDH

Parameters:

Slope = -36.304

P 1 hr: = 3584.03

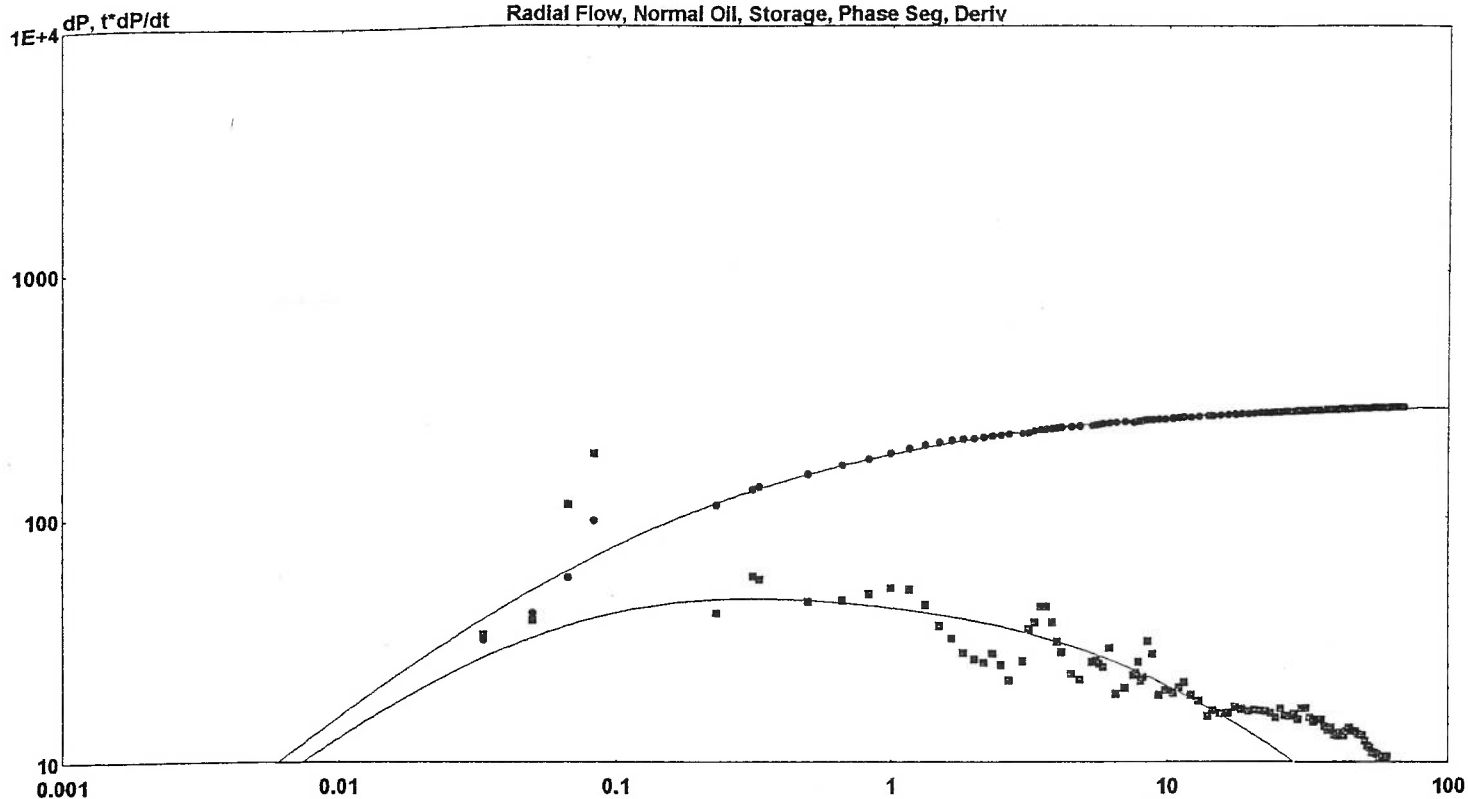
Calculated Values:

kh = 3900.3 md-ft

k = 27.4669 md

Skin = -0.1143

Succo #1 Pressure Falloff Test 11/97  
 Radial Flow, Normal Oil, Storage, Phase Seg, Deriv



Succo #1 Pressure Falloff Test 11/97

Analysis Results: Radial Flow, Normal Oil, Storage, Phase Seg, Deriv

Dimensionless Parameters:

$tD/CD(1) = 23.951$   
 $pD(1) = 0.01083$   
 $CaDe2S = 0.9895$   
 $CD/CaD = 1$   
 $CpD = 4$

Calculated Values:

Std Dev = 4.1016  
 $k = 9.3767$  md  
 $kh = 1331$  md-ft  
 $S = -4.439$   
 $CD = 7093$

Lightning Wireline, Inc.  
P.O. Box 1531  
Loveland, Colorado 80539

Tel: (970) 669-8059 Fax: (970) 669-4077

B.H.P. TEST REPORT

Company : Wright's Disposal

Well Number	: Succo #1	Tubing size	: 2 7/8
Test date	: 11/04/98-11/07/98	Packr set at	: 9149
Lease	: Succo Injection	Casing size	: 5 1/2
Field	: Wattenberg	Perforations	: 9276'-9418'
County	: Weld	Instrument #	: MicroSmart 192
State	: Colorado	Tested by	: JMR
Location	: Section 10-1N-67W	Calculated by	: ASP
Formation	: Lyons	Gauge set at	: 9149'
Total depth	@ 9573	B.H. Temp. F	: 258

Test type:

Flowing Pressure Gradient	- No
Bottom Hole Pressure Build-up Test	- Yes
Bottom Hole Pressure Draw-Down Test	- No
Shut-in Pressure Gradient	- No

Data File : SUCCO.BHP

Lightning Wireline, Inc.

Company : Wright's Disposal

Well # : Succo #1

Location : Section 10-1N-67W

Lease : Succo Injection

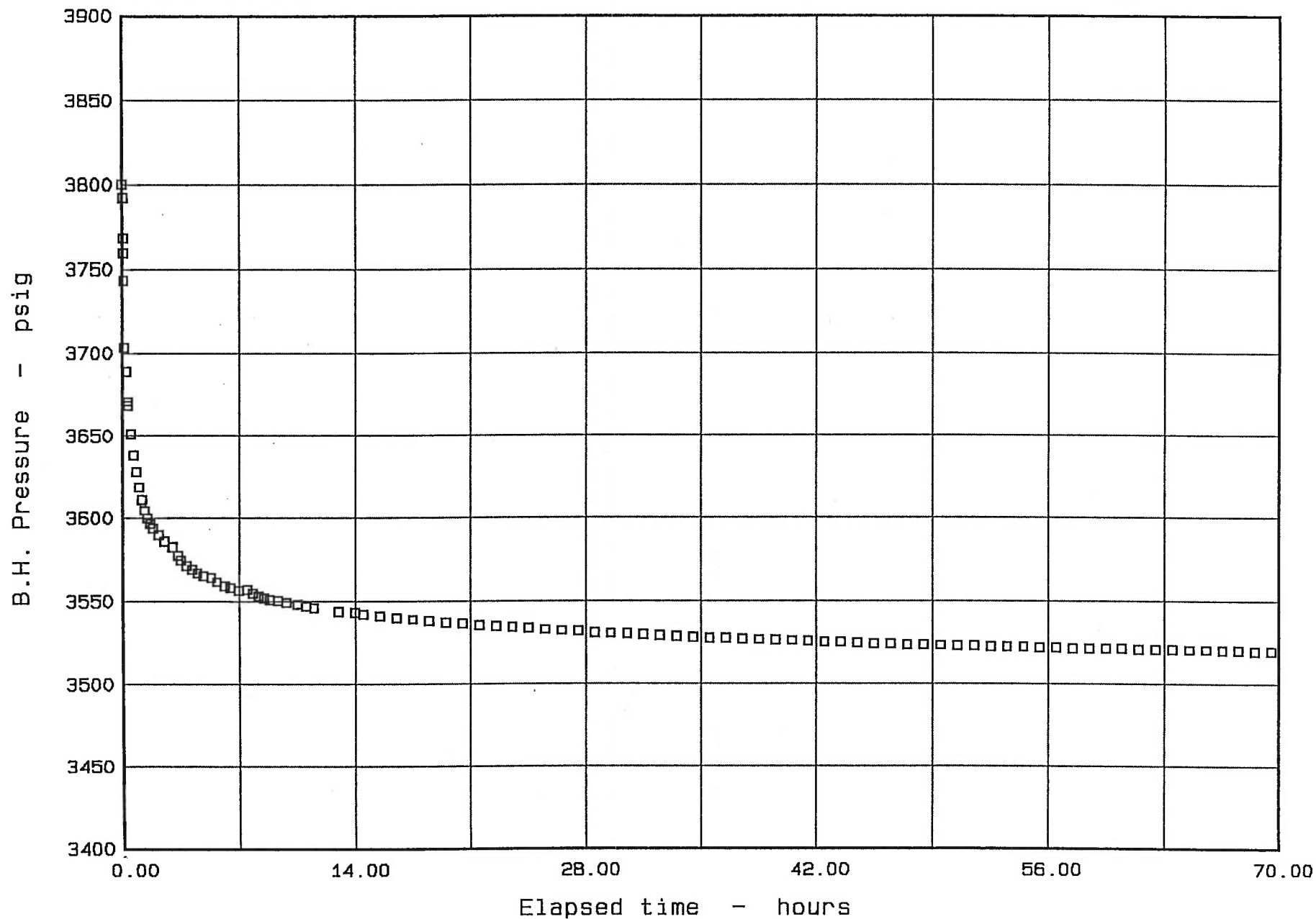
Field : Wattenberg

Test date : 11/04/98-11/07/98

County : Weld

State : Colorado

File - SUCCO



Lightning Wireline, Inc.

Company : Wright's Disposal

Lease : Succo Injection

County : Weld

Well # : Succo #1

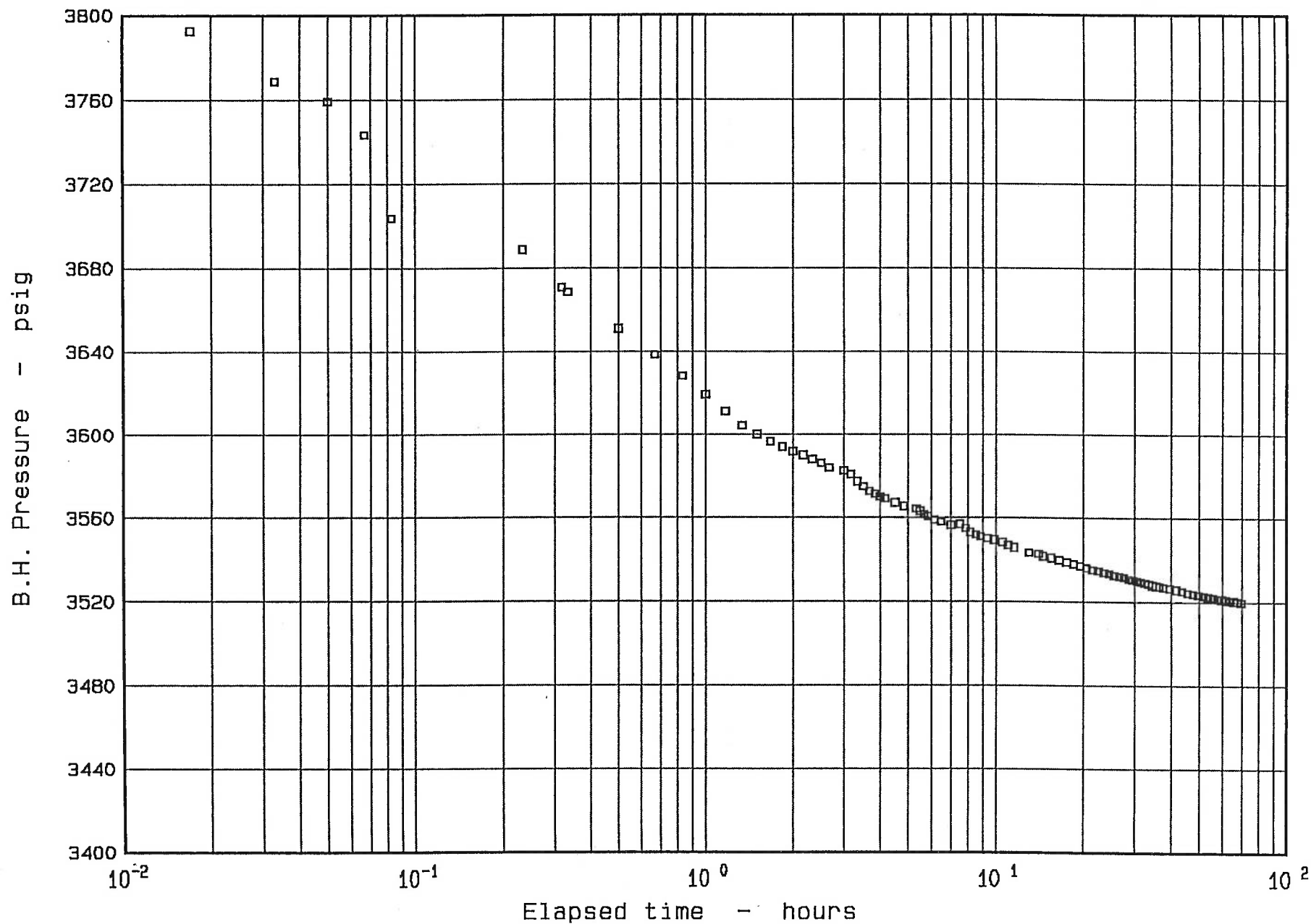
Field : Wattenberg

State : Colorado

Location : Section 10-1N-67W

Test date : 11/04/98-11/07/98

File - SUCCO





Lightning Wireline, Inc.

Company : Wright's Disposal

Well # : Succo #1

Location : Section 10-1N-67W

Lease : Succo Injection

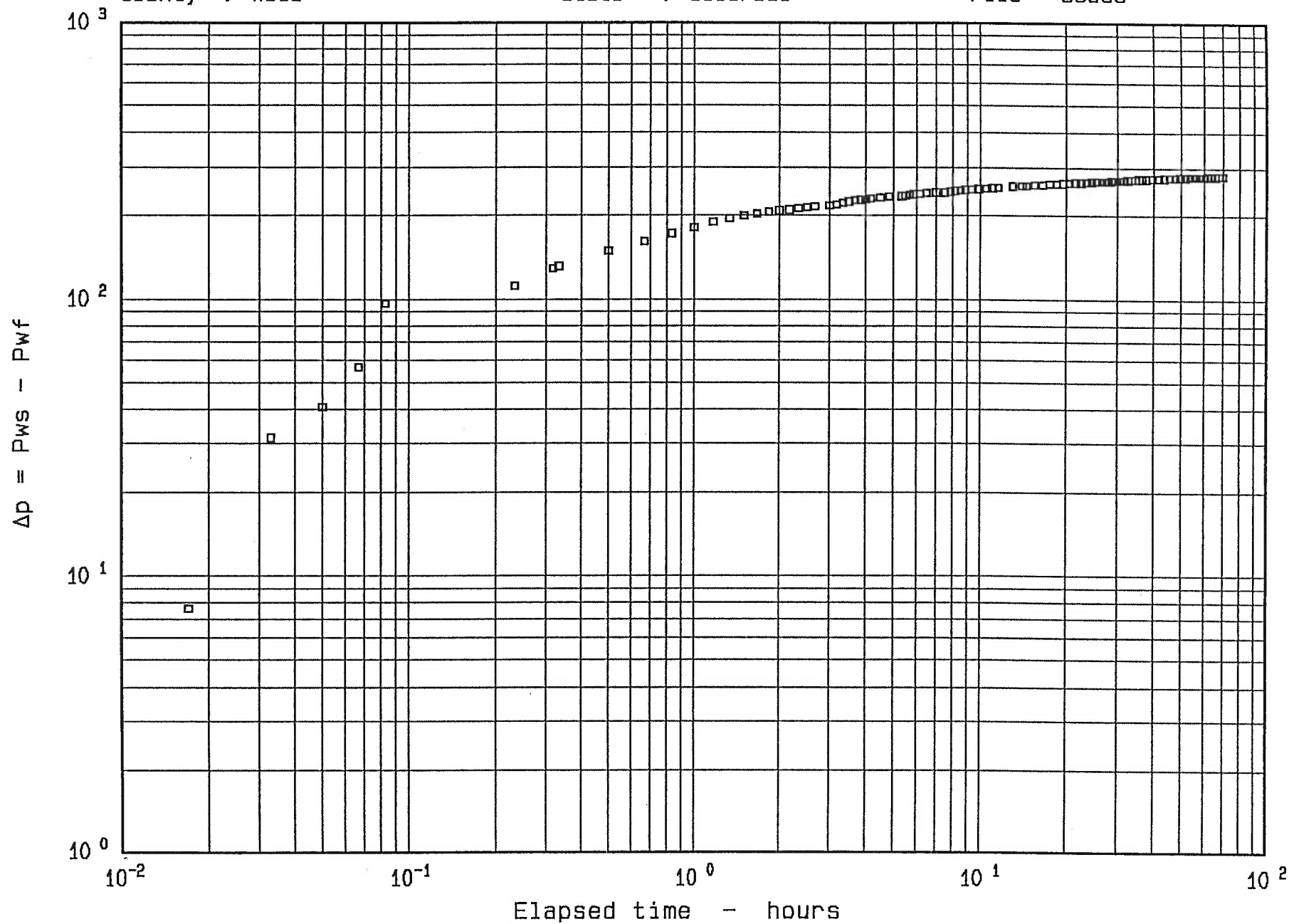
Field : Wattenberg

Test date : 11/04/98-11/07/98

County : Weld

State : Colorado

File - SUCCO



Shut-in Pressure Log-Log Plot

# Bottom Hole Pressure Build-up Test

Company : Wright's Disposal

Well Number : Succo #1 Test date : 11/04/98-11/07/98

Data File : SUCCO.BHP

Remarks:

Delta Time (hours)	Pressure (psig)	Pressure (psia)	Delta Pressure (psia)
0.0000	3,800.00	3,800.00	
0.0170	3,792.36	3,792.36	7.64
0.0330	3,768.53	3,768.53	31.47
0.0500	3,759.31	3,759.31	40.69
0.0670	3,743.28	3,743.28	56.72
0.0830	3,703.53	3,703.53	96.47
0.2330	3,688.72	3,688.72	111.28
0.3170	3,670.85	3,670.85	129.15
0.3330	3,668.37	3,668.37	131.63
0.5000	3,650.99	3,650.99	149.01
0.6670	3,638.35	3,638.35	161.65
0.8330	3,628.11	3,628.11	171.89
1.0000	3,618.94	3,618.94	181.06
1.1670	3,611.03	3,611.03	188.97
1.3330	3,604.54	3,604.54	195.46
1.5000	3,600.11	3,600.11	199.89
1.6670	3,596.58	3,596.58	203.42
1.8330	3,593.93	3,593.93	206.07
2.0000	3,591.79	3,591.79	208.21

Cont....

Lightning Wireline, Inc.

Bottom Hole Pressure Build-up Test

Delta Time (hours)	Pressure (psig)	Pressure (psia)	Delta Pressure (psia)
2.1670	3,589.99	3,589.99	210.01
2.3330	3,587.86	3,587.86	212.14
2.5000	3,586.10	3,586.10	213.90
2.6670	3,583.87	3,583.87	216.13
3.0000	3,582.47	3,582.47	217.53
3.1670	3,580.85	3,580.85	219.15
3.3330	3,577.46	3,577.46	222.54
3.5000	3,574.88	3,574.88	225.12
3.6670	3,572.92	3,572.92	227.08
3.8330	3,571.36	3,571.36	228.64
4.0000	3,570.18	3,570.18	229.82
4.1670	3,569.14	3,569.14	230.86
4.5000	3,567.16	3,567.16	232.84
4.8330	3,565.44	3,565.44	234.56
5.3330	3,564.30	3,564.30	235.70
5.5000	3,563.18	3,563.18	236.82
5.6670	3,561.78	3,561.78	238.22
5.8330	3,560.75	3,560.75	239.25
6.1670	3,559.15	3,559.15	240.85
6.5000	3,558.03	3,558.03	241.97
7.0000	3,556.58	3,556.58	243.42
7.5000	3,557.00	3,557.00	243.00
7.6670	3,556.00	3,556.00	244.00
7.8330	3,555.00	3,555.00	245.00

Cont....

Lightning Wireline, Inc.

Bottom Hole Pressure Build-up Test

Delta Time (hours)	Pressure (psig)	Pressure (psia)	Delta Pressure (psia)
8.0000	3,554.00	3,554.00	246.00
8.1670	3,553.00	3,553.00	247.00
8.5000	3,552.00	3,552.00	248.00
8.8330	3,551.00	3,551.00	249.00
9.3330	3,550.25	3,550.25	249.75
9.8330	3,549.46	3,549.46	250.54
10.5000	3,548.32	3,548.32	251.68
11.0000	3,547.08	3,547.08	252.92
11.5000	3,545.94	3,545.94	254.06
13.0000	3,543.56	3,543.56	256.44
14.0000	3,543.11	3,543.11	256.89
14.5000	3,541.98	3,541.98	258.02
15.5000	3,541.05	3,541.05	258.95
16.5000	3,539.96	3,539.96	260.04
17.5000	3,539.00	3,539.00	261.00
18.5000	3,538.12	3,538.12	261.88
19.5000	3,537.17	3,537.17	262.83
20.5000	3,536.43	3,536.43	263.57
21.5000	3,535.57	3,535.57	264.43
22.5000	3,535.00	3,535.00	265.00
23.5000	3,534.20	3,534.20	265.80
24.5000	3,533.59	3,533.59	266.41
25.5000	3,532.86	3,532.86	267.14
26.5000	3,532.38	3,532.38	267.62

Cont....

Lightning Wireline, Inc.

Bottom Hole Pressure Build-up Test

Delta Time (hours)	Pressure (psig)	Pressure (psia)	Delta Pressure (psia)
27.5000	3,531.84	3,531.84	268.16
28.5000	3,531.11	3,531.11	268.89
29.5000	3,530.62	3,530.62	269.38
30.5000	3,530.17	3,530.17	269.83
31.5000	3,529.72	3,529.72	270.28
32.5000	3,529.17	3,529.17	270.83
33.5000	3,528.80	3,528.80	271.20
34.5000	3,528.05	3,528.05	271.95
35.5000	3,527.60	3,527.60	272.40
36.5000	3,527.36	3,527.36	272.64
37.5000	3,526.97	3,526.97	273.03
38.5000	3,526.75	3,526.75	273.25
39.5000	3,526.48	3,526.48	273.52
40.5000	3,526.16	3,526.16	273.84
41.5000	3,525.86	3,525.86	274.14
42.5000	3,525.56	3,525.56	274.44
43.5000	3,525.21	3,525.21	274.79
44.5000	3,524.77	3,524.77	275.23
45.5000	3,524.44	3,524.44	275.56
46.5000	3,524.18	3,524.18	275.82
47.5000	3,523.87	3,523.87	276.13
48.5000	3,523.62	3,523.62	276.38
49.5000	3,523.36	3,523.36	276.64
50.5000	3,523.13	3,523.13	276.87

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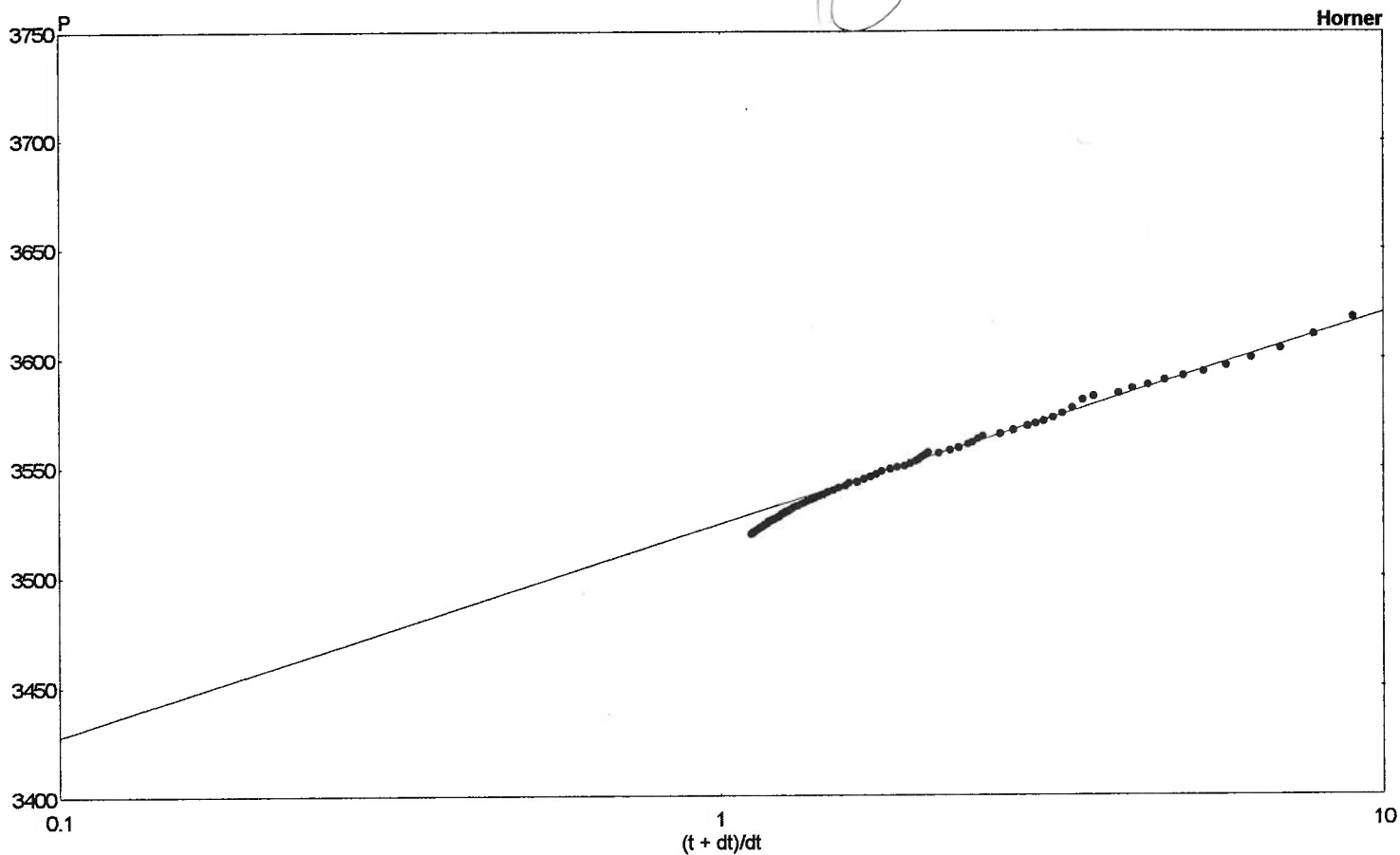
Lightning Wireline, Inc.

Bottom Hole Pressure Build-up Test

Delta Time (hours)	Pressure (psig)	Pressure (psia)	Delta Pressure (psia)
51.5000	3,523.01	3,523.01	276.99
52.5000	3,522.80	3,522.80	277.20
53.5000	3,522.57	3,522.57	277.43
54.5000	3,522.38	3,522.38	277.62
55.5000	3,522.08	3,522.08	277.92
56.5000	3,521.93	3,521.93	278.07
57.5000	3,521.69	3,521.69	278.31
58.5000	3,521.52	3,521.52	278.48
59.5000	3,521.38	3,521.38	278.62
60.5000	3,521.23	3,521.23	278.77
61.5000	3,521.04	3,521.04	278.96
62.5000	3,520.87	3,520.87	279.13
63.5000	3,520.77	3,520.77	279.23
64.5000	3,520.64	3,520.64	279.36
65.5000	3,520.55	3,520.55	279.45
66.5000	3,520.36	3,520.36	279.64
67.5000	3,520.21	3,520.21	279.79
68.5000	3,519.99	3,519.99	280.01
69.5000	3,519.92	3,519.92	280.08

Lightning Wireline, Inc.

## Succo #1 Pressure Falloff Test 11/97



## Succo #1 Pressure Falloff Test 11/97

Analysis Results: Horner

## Parameters:

Slope = 96.7771

 $m(1 \text{ hr}) = 3616.94$ 

Prd Time: = 8 hr

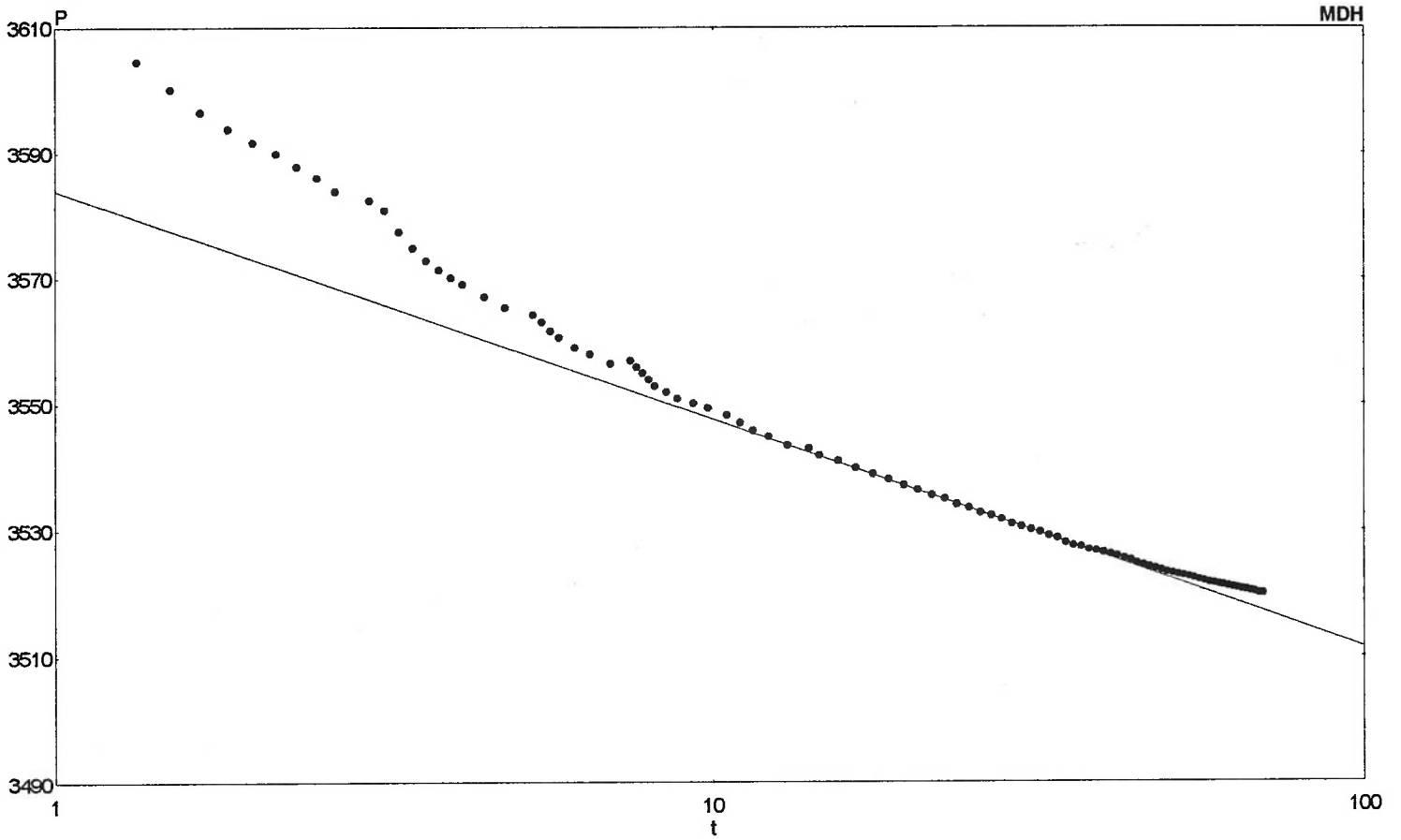
## Calculated Values:

 $kh = 1463.12 \text{ md-ft}$  $k = 10.3036 \text{ md}$ 

Skin = -4.23644

 $P^* = 3524.6 \text{ psi}$

Succo #1 Pressure Falloff Test 11/97



Succo #1 Pressure Falloff Test 11/97

Analysis Results: MDH

Parameters:

Slope = -36.304

P 1 hr: = 3584.03

Calculated Values:

kh = 3900.3 md-ft

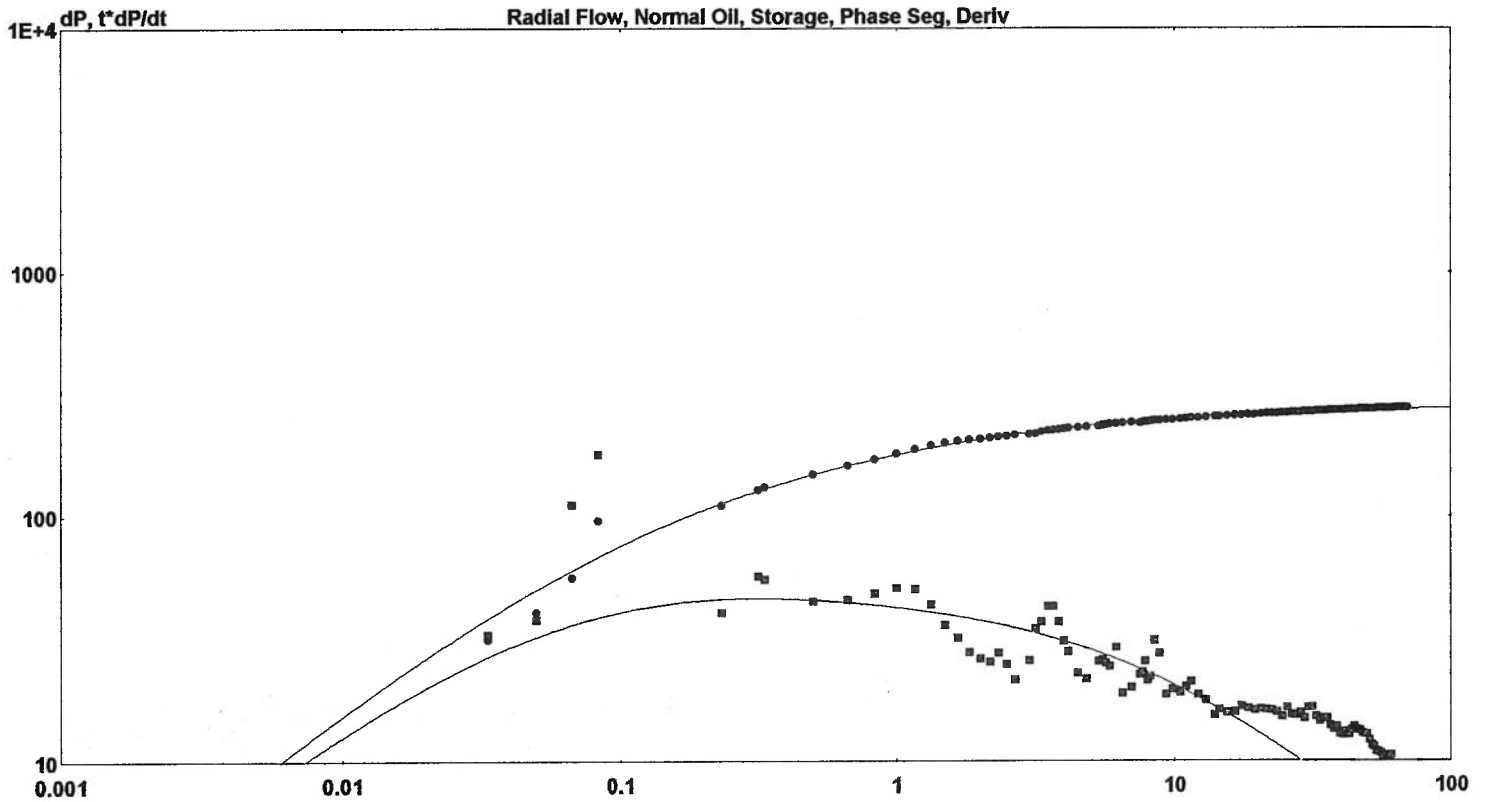
k = 27.4669 md

Skin = -0.1143



# Succo #1 Pressure Falloff Test 11/97

Radial Flow, Normal Oil, Storage, Phase Seg, Deriv



Succo #1 Pressure Falloff Test 11/97

Analysis Results: Radial Flow, Normal Oil, Storage, Phase Seg, Deriv

## Dimensionless Parameters:

$tD/CD(1) = 23.951$   
 $pD(1) = 0.01083$   
 $CaDe2S = 0.9895$   
 $CD/CaD = 1$   
 $CpD = 4$

## Calculated Values:

Std Dev = 4.1016  
 $k = 9.3767$  md  
 $kh = 1331$  md-ft  
 $S = -4.439$   
 $CD = 7093$

Lightning Wireline, Inc.  
P.O. Box 1531  
Loveland, Colorado 80539

Tel: (970) 669-8059 Fax: (970) 669-4077

B.H.P. TEST REPORT

Company : Wright's Disposal

Well Number	: Succo #1	Tubing size	: 2 7/8
Test date	: 11/04/98-11/07/98	Packr set at	: 9149
Lease	: Succo Injection	Casing size	: 5 1/2
Field	: Wattenberg	Perforations	: 9276'-9418'
County	: Weld	Instrument #	: MicroSmart 192
State	: Colorado	Tested by	: JMR
Location	: Section 10-1N-67W	Calculated by	: ASP
Formation	: Lyons	Gauge set at	: 9149'
Total depth	@ 9573	B.H. Temp. F	: 258

Test type:

Flowing Pressure Gradient	- No
Bottom Hole Pressure Build-up Test	- Yes
Bottom Hole Pressure Draw-Down Test	- No
Shut-in Pressure Gradient	- No

Data File : SUCCO.BHP

Lightning Wireline, Inc.

Company : Wright's Disposal

Lease : Succo Injection

County : Weld

Well # : Succo #1

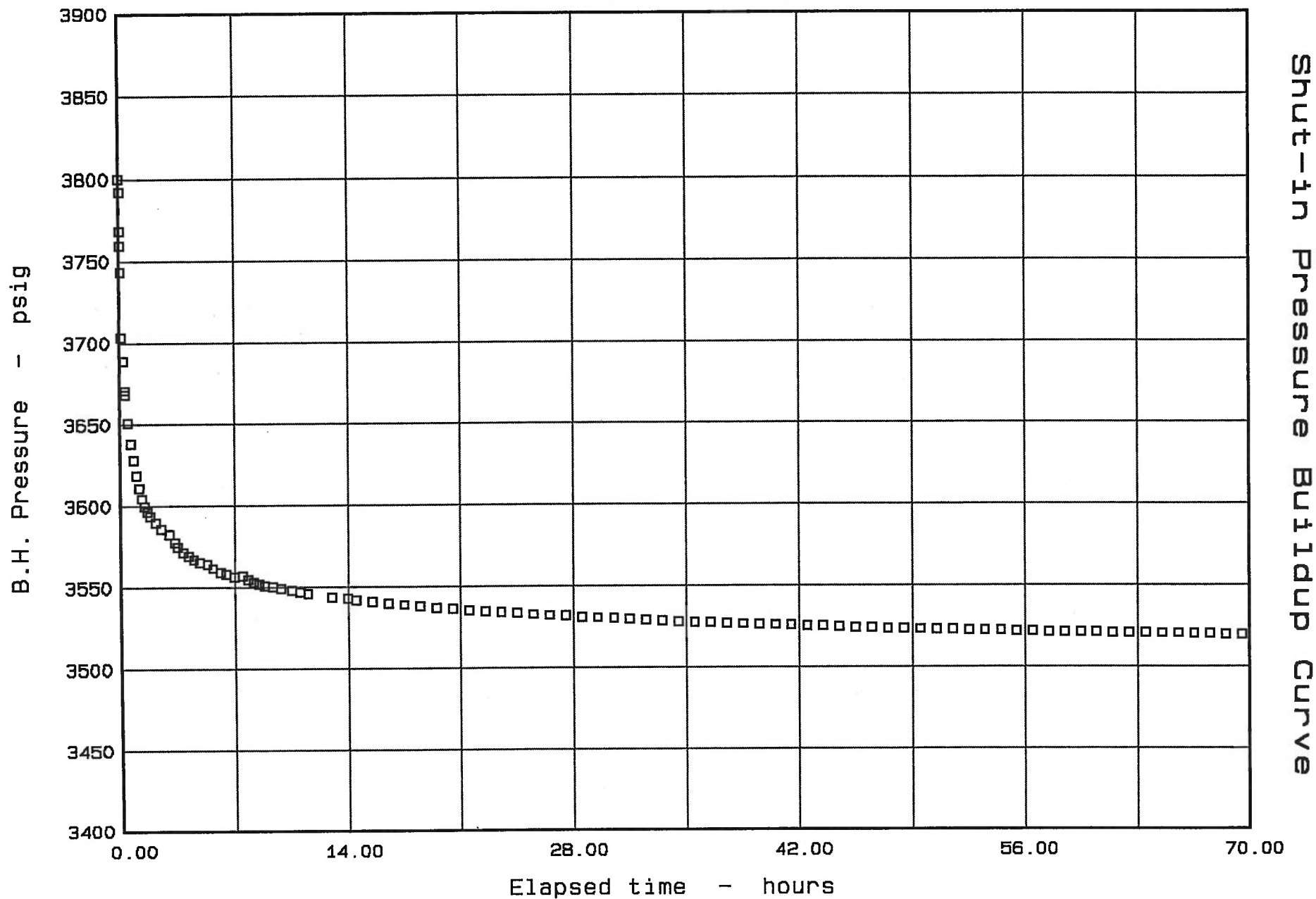
Field : Wattenberg

State : Colorado

Location : Section 10-1N-67W

Test date : 11/04/98-11/07/98

File - SUCCO



Lightning Wireline, Inc.

Company : Wright's Disposal

Lease : Succo Injection

County : Weld

Well # : Succo #1

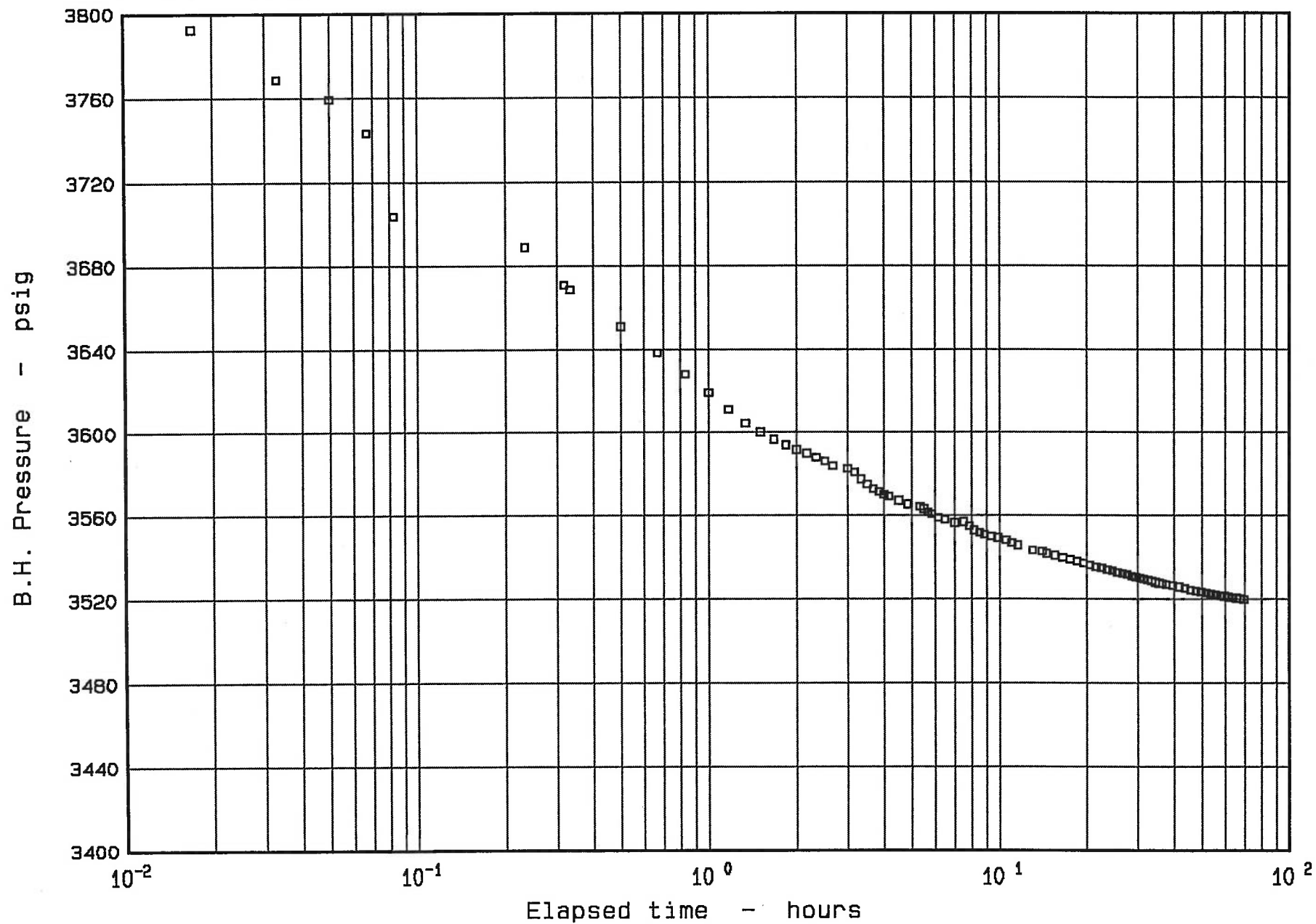
Field : Wattenberg

State : Colorado

Location : Section 10-1N-67W

Test date : 11/04/98-11/07/98

File - SUCCO



Lightning Wireline, Inc.

Company : Wright's Disposal

Lease : Succo Injection

County : Weld

Well # : Succo #1

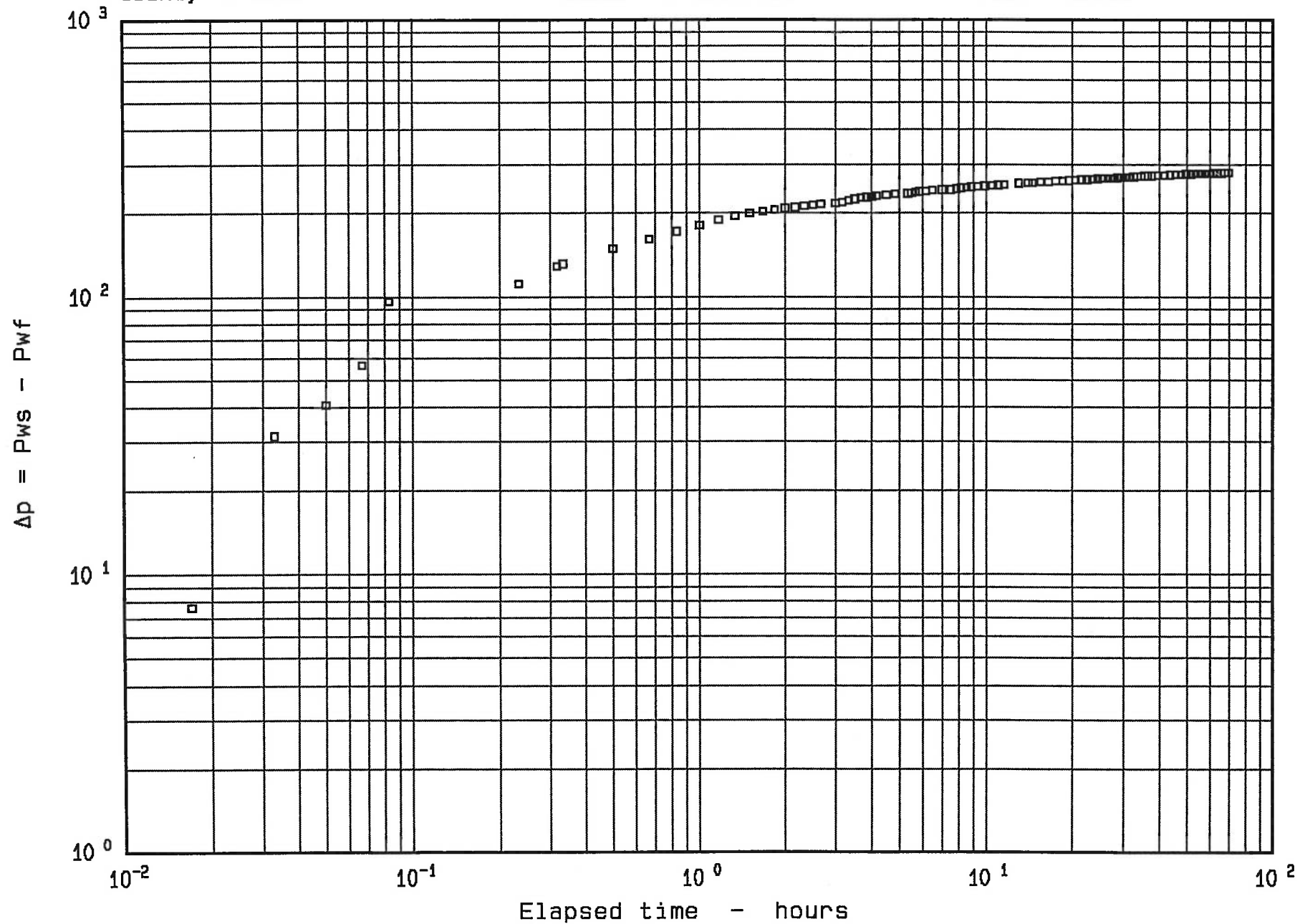
Field : Wattenberg

State : Colorado

Location : Section 10-1N-67W

Test date : 11/04/98-11/07/98

File - SUCCO



Bottom Hole Pressure Build-up Test

Company : Wright's Disposal

Well Number : Succo #1                      Test date : 11/04/98-11/07/98

Data File : SUCCO.BHP

Remarks:

Delta Time (hours)	Pressure (psig)	Pressure (psia)	Delta Pressure (psia)
0.0000	3,800.00	3,800.00	
0.0170	3,792.36	3,792.36	7.64
0.0330	3,768.53	3,768.53	31.47
0.0500	3,759.31	3,759.31	40.69
0.0670	3,743.28	3,743.28	56.72
0.0830	3,703.53	3,703.53	96.47
0.2330	3,688.72	3,688.72	111.28
0.3170	3,670.85	3,670.85	129.15
0.3330	3,668.37	3,668.37	131.63
0.5000	3,650.99	3,650.99	149.01
0.6670	3,638.35	3,638.35	161.65
0.8330	3,628.11	3,628.11	171.89
1.0000	3,618.94	3,618.94	181.06
1.1670	3,611.03	3,611.03	188.97
1.3330	3,604.54	3,604.54	195.46
1.5000	3,600.11	3,600.11	199.89
1.6670	3,596.58	3,596.58	203.42
1.8330	3,593.93	3,593.93	206.07
2.0000	3,591.79	3,591.79	208.21

Cont....

Lightning Wireline, Inc.

Bottom Hole Pressure Build-up Test

Delta Time (hours)	Pressure (psig)	Pressure (psia)	Delta Pressure (psia)
2.1670	3,589.99	3,589.99	210.01
2.3330	3,587.86	3,587.86	212.14
2.5000	3,586.10	3,586.10	213.90
2.6670	3,583.87	3,583.87	216.13
3.0000	3,582.47	3,582.47	217.53
3.1670	3,580.85	3,580.85	219.15
3.3330	3,577.46	3,577.46	222.54
3.5000	3,574.88	3,574.88	225.12
3.6670	3,572.92	3,572.92	227.08
3.8330	3,571.36	3,571.36	228.64
4.0000	3,570.18	3,570.18	229.82
4.1670	3,569.14	3,569.14	230.86
4.5000	3,567.16	3,567.16	232.84
4.8330	3,565.44	3,565.44	234.56
5.3330	3,564.30	3,564.30	235.70
5.5000	3,563.18	3,563.18	236.82
5.6670	3,561.78	3,561.78	238.22
5.8330	3,560.75	3,560.75	239.25
6.1670	3,559.15	3,559.15	240.85
6.5000	3,558.03	3,558.03	241.97
7.0000	3,556.58	3,556.58	243.42
7.5000	3,557.00	3,557.00	243.00
7.6670	3,556.00	3,556.00	244.00
7.8330	3,555.00	3,555.00	245.00

Cont....

Lightning Wireline, Inc.

Bottom Hole Pressure Build-up Test

Delta Time (hours)	Pressure (psig)	Pressure (psia)	Delta Pressure (psia)
8.0000	3,554.00	3,554.00	246.00
8.1670	3,553.00	3,553.00	247.00
8.5000	3,552.00	3,552.00	248.00
8.8330	3,551.00	3,551.00	249.00
9.3330	3,550.25	3,550.25	249.75
9.8330	3,549.46	3,549.46	250.54
10.5000	3,548.32	3,548.32	251.68
11.0000	3,547.08	3,547.08	252.92
11.5000	3,545.94	3,545.94	254.06
13.0000	3,543.56	3,543.56	256.44
14.0000	3,543.11	3,543.11	256.89
14.5000	3,541.98	3,541.98	258.02
15.5000	3,541.05	3,541.05	258.95
16.5000	3,539.96	3,539.96	260.04
17.5000	3,539.00	3,539.00	261.00
18.5000	3,538.12	3,538.12	261.88
19.5000	3,537.17	3,537.17	262.83
20.5000	3,536.43	3,536.43	263.57
21.5000	3,535.57	3,535.57	264.43
22.5000	3,535.00	3,535.00	265.00
23.5000	3,534.20	3,534.20	265.80
24.5000	3,533.59	3,533.59	266.41
25.5000	3,532.86	3,532.86	267.14
26.5000	3,532.38	3,532.38	267.62

Cont....

Lightning Wireline, Inc.



Bottom Hole Pressure Build-up Test

Delta Time (hours)	Pressure (psig)	Pressure (psia)	Delta Pressure (psia)
27.5000	3,531.84	3,531.84	268.16
28.5000	3,531.11	3,531.11	268.89
29.5000	3,530.62	3,530.62	269.38
30.5000	3,530.17	3,530.17	269.83
31.5000	3,529.72	3,529.72	270.28
32.5000	3,529.17	3,529.17	270.83
33.5000	3,528.80	3,528.80	271.20
34.5000	3,528.05	3,528.05	271.95
35.5000	3,527.60	3,527.60	272.40
36.5000	3,527.36	3,527.36	272.64
37.5000	3,526.97	3,526.97	273.03
38.5000	3,526.75	3,526.75	273.25
39.5000	3,526.48	3,526.48	273.52
40.5000	3,526.16	3,526.16	273.84
41.5000	3,525.86	3,525.86	274.14
42.5000	3,525.56	3,525.56	274.44
43.5000	3,525.21	3,525.21	274.79
44.5000	3,524.77	3,524.77	275.23
45.5000	3,524.44	3,524.44	275.56
46.5000	3,524.18	3,524.18	275.82
47.5000	3,523.87	3,523.87	276.13
48.5000	3,523.62	3,523.62	276.38
49.5000	3,523.36	3,523.36	276.64
50.5000	3,523.13	3,523.13	276.87

Cont....

Lightning Wireline, Inc.



**peterson energy  
management, inc.**

November 23, 1997

Mr. John Carson  
Mail Code 8ENF-T  
U.S. EPA, Region XII  
999 18<sup>th</sup> Street, Suite 500  
Denver, CO 80202-2466

RE: **EPA Permit No. CO1516-02115**  
Wright's Disposal, Inc.  
Suckla Farms Injection Well #1  
NW/4 Sec. 10-T1N-R67W, Weld County, Colorado

Dear Mr. Carson:

In this report we detail the results of the pressure falloff test conducted in the subject well November 4<sup>th</sup>-November 7<sup>th</sup>, 1997. This is the second pressure falloff test conducted in this well. A previous falloff test was conducted in July, 1993, as part of the EPA Class I permitting process.

Electronic downhole memory pressure gauges were installed at a depth of 9149' on November 4, 1997, with the well taking injection water at a rate of 36 BWPH for eight hours on a vacuum. After recording a stabilized bottom hole injection pressure of 3800 psi, the well was shut in for 69.5 hours with tandem pressure gauges left in the hole at the 9149' packer depth. Recovered data quality was good. Bottom-hole pressure at the conclusion of the test was 3520 psi.

In this report, we have estimated the distance to the injected fluid boundary, which was to be the purpose of the series of pressure falloff tests mandated in the Class I permit. Injected fluids appear to have traveled a distance of 664' from the wellbore. This reflects all fluids injected into the well since inception, not just the volume injected in Class I service. This also represents a swept volume of 32 acres. Calculations employ the Merrill, Kazemi & Gogarty (JPT, 1974) method of estimating injection well flood fronts.

The EPA Final Permit for this facility specified an allowable injection radius of one-quarter mile, or 1320 feet. This analysis indicates that injected fluids have not reached this limit at this time. Given the conservative porosity assumptions

**petroleum engineering**

discussed below, the injected fluid front is at least 656 feet from the specified quarter-mile boundary. To estimate the time remaining before permit limits are reached, we should keep in mind that the distance of the injection front from the wellbore will be increasing at a slower rate as time progresses. We assume a radial configuration for the affected area, and for a constant fluid injection rate, the injection front distance from the wellbore increases only as the square root of injected volumes (or time), not linearly. While successive falloff tests will help locate the injection front, the permit distance limit will not be reached in the near future.

Total system porosity is an important variable affecting test analysis and injection front calculations. As discussed in our 1993 report following the initial falloff test, the openhole log porosity of six percent is likely on the low side, and is not indicative of total system porosity. If system porosity is actually higher, as the well injectivity seems to indicate, the injection front would actually be closer to the wellbore than these calculations indicate. As a result, the distances calculated in this report are believed to be conservative.

The three day shut in period used in this test was adequate for accurate analysis at this time. To see the flood front as distances increase, we suggest that future tests increase the shut in time one day per year, until conditions dictate a slower rate of change. The bottom hole pressure gauges used on this test were necessary, as the well did not maintain a positive surface pressure during the test. This was not the case on the initial falloff test in 1993, when injection rates were higher. Recorded data quality also appeared better on this test than on the 1993 test, which used surface recording gauges.

We have enjoyed this opportunity to be of service to your agency. Please do not hesitate to call with any questions.

Sincerely,

Peterson Energy Management, Inc.

A handwritten signature in blue ink that reads "Andy Peterson" followed by a stylized flourish.

Andy Peterson  
President

cc: Wright's Disposal, Inc.